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WASHINGTON HEALTH RULES

A COMMENTARY ON THE TWELVE HEALTH RULES FORMULATED AND DISTRIBUTED BY THE

ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS
OF THE DISTRICT OF COLUMBIA

A COLLECTION OF CHAPTERS DEALING WITH THE ESSENTIALS OF HYGIENE AND ADAPTED FOR SCHOOL TEACHERS AND FOR NORMAL SCHOOL PUPILS

1915

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HYGIENE HELPS THE STRONG TO REMAIN STRONG, THE WEAK TO BECOME STRONG, AND, BY PREVENTING SICKNESS, LENGTHENS THE AVERAGE SPAN OF HUMAN LIFE.

COMMITTEE ON PUBLICATIONS

of the

ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS

of the

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INTRODUCTION

SANITARIANS realize that the success of the campaign for the prevention of any disease must depend to a great extent upon the education of the public as regards the specific cause of the disease; the channels by which it gains access to the human body (infection); the prevention of infection; and the measures by which the development of the disease may be prevented or arrested in those already infected.

It is a well-established fact that an attack, for instance, of tuberculosis, in any of its forms, depends upon two factors; first, the introduction of the germ (tubercle bacillus); second, the susceptibility of the individual. There can be no tuberculosis in the absence of the germ, and the introduction of the germ into the body of an immune individual will not give rise to an attack of tuberculosis. Fortunately, adults, in a good state of health, have very little susceptibility to the disease. The susceptibility of children is much greater. But a majority of those who are infected in childhood, by association with persons suffering from pulmonary tuberculosis, do not become victims of the disease. Still the number who do contract tuberculosis, in one form or another, is very great, and, as is well known, this disease is the leading factor in our mortality statistics. The fact that infection usually occurs in childhood is now well established. As a result of such infection some children die early

of tubercular meningitis, or tubercular peritonitis; others develop during youth tubercular diseases of the glands (scrofula) or of the bones and joints (hip-joint disease, "white swelling" of the knee, "Potts disease" of the spine, etc.); others suffer from pulmonary tuberculosis, which usually develops during young adult life (15 to 30 years), and is often very slow and insidious in its development. It is now generally recognized that in its earlier stages pulmonary tuberculosis is a very curable disease. But, unfortunately, the earliest manifestations of the disease are usually overlooked or wilfully ignored by the patient, and, too often are not recognized by the physician, if one is consulted.

It is evident that our campaign of education must have in view the guarding of our citizens from infection, and also from the development of an attack if infection has unfortunately occurred. That a slight infection may remain dormant for years without any noticeable results is proved by the large number of persons, dying from other diseases, who present evidence of such infection at the autopsy table.

What then are the factors which give rise to the development of the disease, after infection, in certain individuals and to a lifelong immunity from attack in others? No doubt, the result depends in part at least, upon individual predisposition, or susceptibility, which may, to some extent, be inherited. Those who are fortunate enough to inherit a robust constitu-

tion and ample lung capacity, are less liable to the disease than those recognized as "delicate" from birth. But even more important as predisposing causes are post-natal conditions and environment, and attacks of other infectious diseases which reduce the vital resisting power of the individual. Bad housing conditions, insanitary surroundings, insufficient food, excessive fatigue, dissipation, are all factors which tend to overcome the normal resistance to the disease. And certain diseases are especially liable to be followed by an attack of pulmonary tuberculosis, in young adults who have been infected in childhood. Among these we may mention especially measles, typhoid fever and pneumonia. Childbirth and injuries attended with a considerable loss of blood may also be included among the predisposing causes.

What has been said shows clearly enough that general sanitation, and hygienic living, are very important factors in the prevention of tuberculosis, and fully justifies the *Association for the Prevention of Tuberculosis of Washington, D. C.,* in the publication and distribution of the *Health Rules* which serve as a basis for the present publication. These Health Rules were formulated by our Committee on Publications in 1912, and thirty-four thousand copies have already been distributed in the public schools of the city.* They have also been widely distributed in other parts of the country, and have met with general approval. In order that the twelve fundamental topics referred to in these rules may be more fully elucidated, and with

* The U. S. Bureau of Indian Affairs printed and distributed 50,000 of these Health Rules among Indian homes.

a view to giving teachers the necessary data for an intelligent exposition of the several topics, twelve members of the Association have been requested to write brief papers upon these topics. These papers have been read and discussed at regular meetings of the Board of Directors and after revision, where deemed necessary, have been approved by a vote of the Board. They are now published, and will be distributed among the teachers in our public schools, in the hope that they may serve a useful purpose in the campaign of education which, as indicated at the outset of this *Introduction,* we believe to be the most essential measure in our efforts to limit the ravages of tuberculosis in the District of Columbia. We feel that the teaching of hygiene to the children in our public schools, with a view to their protection from this and other infectious diseases, when these pupils are made to fully comprehend the importance to themselves personally of conforming to the Health Rules which have been formulated for their benefit, will be likely to make a deep and lasting impression. We hope, too, that a careful reading of this volume will not only convince teachers of the importance of the truths embodied in these twelve Health Rules, but will make them feel their responsibility, as teachers of the rising generation, for the dissemination of information which is certainly not exceeded in importance by any branch of knowledge they are called upon to teach. That they may become our co-laborers in the campaign for the prevention of tuberculosis is our earnest wish.

GEORGE M. STERNBERG.

GOOD AIR

HEALTH RULE I

Avoid badly ventilated, badly lighted, dusty, dirty, overheated, crowded or damp rooms.

Air in Its Relation to Life and Health.

When we consider that the air we breathe extends to every conceivable place and how easily it may be polluted, and how frequently the nature of the substance causing the pollution is such that it can not be detected by our special senses, the importance of the "Health Rule" under consideration is apparent.

Air is essential to life. Everyone knows that if we are not provided with food we become hungry and should we go a sufficient number of days without it our bodies show a gradual loss of weight and we finally die. However, if with an abundance of food supplied us, we were confined within a small space and denied fresh air, we would suffer and die in a much shorter period of time. Therefore, *fresh* air is as necessary to life as pure food.

That we may better understand what is meant by "fresh air," or "pure air," let us consider what air really is. Air is a mixture of gases the most important of which is oxygen, because this gas is the one necessary to life. Several other gases, such as nitrogen, hydrogen, argon, carbon dioxide, and ammonia,

are present in varying quantities, together with minute particles of dust and bacteria. The purity of air is determined by the amount of oxygen it contains and the extent of its freedom from carbon dioxide, foreign gases, dust and bacteria.

Air becomes unwholesome and polluted most commonly by dust and by the exhalations from human beings and animals. When breathed in by a living body the oxygen is extracted from the air and absorbed into the blood, whereas carbon dioxide, certain volatile organic products, moisture, and body heat are eliminated in the expired air. Besides these eliminations from the lungs there are also given off into the air surrounding living bodies, volatile organic products and heat from the body surface.

From the earliest times it has been known that human beings vitiate the air surrounding their bodies. This vitiation has been ascribed to many different factors. At the present time, many authorities believe that it is not so much a question of an increase in the amount of carbon dioxide, or a decrease in the relative amount of oxygen in the air of an overcrowded space, occupied by living beings, that causes discomfort and illness. This discomfort and illness is ascribed by them to stagnation of the air. The heat and moisture being constantly given off by the lungs and body surface pass into the surrounding air, which, in the absence of an influx of fresh air or active circulation, becomes surcharged with moisture and heat, seriously interfering with the further elimi-

nation of body heat and moisture which is demanded by nature to preserve normal bodily functions.

Thus we are led to believe that the more important factors of ventilation are temperature, humidity, and air movement. The most recent investigations along the line of ventilation show that to maintain the bodily functions, in a manner most conducive to good health, there should be maintained an atmosphere which most nearly approximates out of door conditions.

In the wide open "out of doors" where the wind keeps the air constantly in circulation, where the purifying processes of plant life remove the carbon dioxide and liberate oxygen, where the rain and the dews wash out the dust, and where the sunshine kills the bacteria, fresh pure air is always present.

But what about indoors where plant life is usually absent, winds do not have access, and people are confined to small spaces as compared to the open? Within any given space, whether it be the home, the school, the street car or the moving picture theater, the air will be stagnant and unwholesome in proportion to the number of people occupying the space and the means at hand for supplying fresh air to replace that polluted by those present. By this, we may see that in all enclosed spaces, to have pure wholesome air to breathe, it is absolutely necessary that fresh air be continually supplied from out of doors.

Many means are employed to keep the air in rooms fresh. The supplying of heated fresh air under pres-

sure is the system commonly used in large buildings, such as theaters, schools and churches. With this system a vent is provided in each room near the floor and the heated air is directed into the room near the ceiling. By the downward pressure of the fresh air entering, the stale air in the room is forced out through the vent.

The usual way to ventilate small rooms, such as living rooms, is by means of open windows. To get the best results from this method two windows on opposite sides of the room should be partially open, one at the top and one at the bottom. The air in a heated building is lighter than the air on the outside. This being the case the air from within, in an attempt to escape, will pass to the outside, producing sufficient suction to draw within the room, cool, fresh air.

When the air in a room has become so polluted and stagnant by body exhalations as to become unpleasant, and dangerous, several means are at hand to detect the same. First there is a sense of heaviness to the air and on entering such a room from the outside one notices a distinct odor. Next there comes over one a feeling of oppression and difficulty in breathing, which may develop into a dizziness. Oftentimes, however, air which may not be so stagnant as to cause the above conditions to present themselves, is yet far from a healthy air to breathe. If you knew that certain food you were about to take into your mouth was not clean you would not eat it. Do you

take the same precaution in regard to the air you take into your lungs?

Many bacteria and germs of disease live and persist much longer in stale polluted air than in fresh air. Dark, damp, dirty, and poorly ventilated rooms are favorable for preserving the vitality of the germs which cause consumption, pneumonia, grippe, and contagious colds. People who occupy such rooms invariably show a higher disease rate and death rate than those who pass most of their time in the open, or in light, dry, well ventilated quarters.

From the above it may be seen that should you desire to be strong and healthy you should spend just as much of your time out of doors as possible. Of course it is impossible to be in the open all the time, but when compelled to be within doors one should always be careful to see that a liberal supply of fresh air enters the room one occupies.

The effect of fresh air on our every day activities is far greater than many of us realize. As an illustration of the effect of a liberal supply of pure air to children in school I would like to call attention to certain facts which have been observed in careful studies made of classes in "fresh air schools."

The pupils of fresh air classes, in ordinary school rooms, the windows of which are kept continually open, upon careful and repeated examination, invariably show, during a given period of time, an increase in weight and height greater than that of children of the same type occupying ordinary class rooms where no par-

ticular attention is paid to ventilation. The usual absence on account of sickness is also much less among the pupils of the fresh air classes. Late in the afternoon, near closing time, the pupils in the fresh air classes appeared as fresh, alert and ready for their lessons as when they arrived in the morning, whereas pupils in the ordinary class rooms, by the middle of the afternoon session, were found to be languid, tired and it was next to impossible to hold their attention to the lessons upon which they were engaged. The children in the fresh air classes appeared to enjoy their studies, being bright eyed and rosy cheeked, but the pupils in the ordinary class rooms were pale, heavy eyed and appeared to be working under a strain.

Recent studies in ventilation have had a most wholesome effect in shaping modern ideas as to the effects of drafts. The present view of many authorities as to the effect of drafts is that with proper clothing protection, drafts of fresh air are not harmful. In many cases where the persons exposed are healthy and robust this is undoubtedly true. However, it should be borne in mind that direct currents of cold air from outside, when the difference in the temperature within and without is very marked, may in some persons cause a congestion of the part of the body against which the air current is directed. Persons who are debilitated or whose general condition is below par, although oftentimes benefited by a bountiful supply of fresh air, should not be subjected to direct drafts of air of a decidedly lower temperature

than the room occupied. Of the diseases and conditions directly or indirectly ascribed to exposure to cold and drafts, by the older text books, recent studies tend to show that most of these conditions are usually due to bacterial infections.

The beneficial effect of fresh air in sleeping rooms should be more generally appreciated. Where the windows are kept open in sleeping rooms rest-disturbing dreams are rare and upon awaking in the morning the sleeper feels refreshed and ready for a day's work.

People should always consider the purity of the air they breathe just as much as they consider the purity of the food they eat. Places not provided with proper means of ventilation should be shunned if health is desired. Crowded, ill-lighted, overheated, and poorly ventilated rooms are the very best friends of whooping cough, scarlet fever, diphtheria, measles, colds, tuberculosis, and pneumonia, as the danger of contagion is much greater under such circumstances and the resistance of the body against infection is reduced.

We may accept with little fear of contradiction the fact that the open air is most valuable in many diseased and abnormal conditions, such as tuberculosis, pneumonia, anemias, heart disease, and various nervous disorders. If the open air is most useful in the cure of these pathological conditions is it not safe to assume that the fresh air of the open is of great value in the prevention of these diseases? That this is true has been amply demonstrated by observation and comparative statistics.

ARTHUR L. MURRAY

AVOID HOUSE DUST

HEALTH RULE II

Breathing dust, notably house dust, often causes disease.

Have no tacked down carpets and mattings. Have loose pieces or rugs, and clean them frequently outdoors.

Use a hair broom for your floors and keep lower sashes closed while sweeping or dusting. Open upper sashes if possible.

Never sweep rooms with a broom that raises dust.

Household dust is extremely objectionable because dust and germs always go hand in hand. Uffelmann, a well known authority on the subject, found that while the outer air contained only 250 germs per cubic meter, the air of his library contained 2,900, of his sitting room 7,500, of his bedroom 12,500, and the air of a living room of a workingman's family as many as 31,000 germs. He also demonstrated that they increased after disturbing the dust of the rooms by featherdusters or by slamming the doors, showing that they actually cling to the household dust. If the dust should happen to contain the germs of tuberculosis, from carelessly expectorated sputum, or of any other infectious disease which may have been carried into the house upon the soles of foot-wear, or the bottom of skirts, such dust may prove a source of danger, especially to children.

AVOID HOUSE DUST

It should be remembered that the habitual inhalation of any kind of dust is harmful, as it predisposes to diseases of the respiratory passages, and also irritates the mucous membranes of the eyes, nose and throat. While 75 per cent of the dust lodges in the nose and throat or finds its way into the stomach, the remainder lodges on the mucous membrane of the air passages of the lungs. Here the dust acts as a foreign body, and nature makes an effort to expel it by coughing, by means of which the coarser particles may be expectorated. Nature also provides means for the elimination of the finer particles of dust, but when the protective forces, such as the ciliated epithelium and white corpuscles of the blood, are imposed upon too much, their function is impaired and much of the dust remains.

Dust also acts as an irritant and causes catarrhal conditions of the mucous membranes and even more serious chronic inflammation of the respiratory organs. The chronic inflammatory conditions thus produced naturally favor infection with the tubercle bacillus, or may light up a latent infection contracted in early life.

It is now generally held that in the majority of instances, probably in 90 per cent, tuberculosis is contracted in childhood and the germs remain dormant until adverse conditions create a favorable soil for their growth and development. Such a soil is usually found in persons whose body has been weakened from any of the numerous causes which may produce this result such as a previous attack of sickness, malnutri-

tion, loss of sleep, vice and dissipation and all the home factors already alluded to.

The influence of dust on the prevalence of this disease is strikingly shown by the fact that the tuberculosis rate among 472,000 males, in the United States, exposed in 15 occupations to the inhalation of dust, was 2.29 per 1,000, against a rate of 1.55 for all occupied males. Statistics collected by Sommerfeld show that, with an average tuberculosis death rate of 4.93 per 1,000 in the population of Berlin, the rate in nondusty trades was 2.39 and in dusty trades 5.42, showing that the death rate from tuberculosis in dusty trades is about double that of others.

House Furnishings. For reasons already given, there should be no accumulation of dust in any part of the house. Hygiene condemns all interior ornamentation and unnecessary furniture which will serve as dust and germ traps, such as heavy cornices, elaborate mouldings of doors and window frames, wardrobes, cumbersome draperies, tacked down carpets and matting. Hygiene on the other hand approves of neatly polished floors, with small rugs which can be easily taken up and frequently cleaned outdoors; curves instead of cornices and angles; plain window and door trimmings; smooth and nonabsorbent walls, instead of embossed wall paper; and simplicity of furniture. In brief, everything which will prevent the collection of dust and germs and facilitate their removal may be regarded as hygienic. So for example, a plain, tinted, smooth wall, or the varnished

wall papers, which can be cleaned with a damp cloth, are in point of health superior to the embossed silk hangings and tapestries of the rich man's home. The same is true of simple picture frames, and furniture.

House-cleaning. The object of house cleaning is primarily to get rid of the dust and germs. In sweeping, it is desirable, therefore, to open the upper windows, but to keep the lower sashes and the door leading into the hall closed, so that the dust may not be wafted back into other parts of the house, and into the noses and lungs of people that are about, because the cool outer air invariably rushes into the lower sashes when these are raised, while the warmer air of the room passes out at the top when the upper sashes are lowered. If lambrequins or curtains obstruct, it is best not to open any window during sweeping and dusting unless a strong draught from the other side of the room can blow the dust out.

Sweeping should be done by means of hair brooms, carpet sweepers or vacuum cleaners. Always avoid brooms that raise dust. The dusting in the absence of vacuum cleaning should be done with a soft damp cloth, frequently rinsed. Under no circumstances should the feather duster be used inside of the house, as it does not remove, but simply displaces the dust. If the cracks in the floors have been neatly filled, and the floors themselves oiled or waxed, they can be cleaned with a damp cloth much more effectively than by the tiresome process of scrubbing, a drudgery to every neat housekeeper.

GEORGE M. KOBER

PURE WATER

HEALTH RULE III

Drink pure water.

Avoid water from shallow and unprotected wells, and from ponds and streams.

If in doubt, boil the water.

Washington water is safe to drink.

Avoid public drinking cups.

A sufficient quantity of water in one form or another is quite essential to the existence and normal activity of every living thing. Just as a pond or lake, deprived of its continuous supply of replenishing water, first becomes stagnant and overburdened with the waste products of the life it harbors, and finally dries up and disappears, so the living organism, be it plant or animal, land or aquatic is dependent for its wellbeing upon a continuous flow of water through its system.

Plants utilize the flowing sap for the distribution of food and mineral salts. The higher animals possess more complex circulatory systems, but in each case water is the transporting medium, the one liquid substance common to all forms of life.

In the human body, water not only furnishes the transportation system, carrying the materials of construction to the points where they are needed, but it is also the cleansing and flushing system of the body,

carrying away the waste products of life through the various channels of excretion. Upon the skin, as perspiration and from the lungs, it also cools the body by evaporation. Without this cooling effect the proper thermal regulation of the body could not be maintained in warm weather, and man would be forced to migrate like the birds, or confine his habitation to the colder regions of the world.

The need for water at all times and larger quantities during warm weather is therefore a fundamental physiological fact.

This necessary water is obtained in part in our food and food beverages, but additional water must be had to meet the demands of the body, and a free use of water for drinking is one of Nature's best medicines.

Avoid Impure Water.

The drinking of pure water is a health-giving necessity, but the drinking of impure water often leads to sickness and death. Water as Nature prepares it is the purest water known to science. It is distilled by evaporation from the seas, lakes, and rivers, and by condensation in the pure cold upper strata of the atmosphere. In falling to the earth as rain, it absorbs small quantities of the gases of the air, and washes from the air much of the smoke, dust and floating debris. Coming into contact with the soil it dissolves mineral and organic materials on its way to brook or river. Worst of all it is deliberately polluted by man.

The sewage of cities, or of country homes, the drainage from manured fields, and the multitudinous wastes of great industries are conducted or find their way eventually to the streams. Even the little mountain brook, ever the inspiration of the poet and the joy of the nature-lover, may carry in its innocently sparkling flow the drainage from a careless farmer's privy or direct pollution from one who, while enjoying its beauty, will not hesitate to ravish its innocence and purity. The use of the larger streams for carrying away the wastes of cities has come to be an economic necessity. Purification of these wastes is being demanded by the sanitary authorities and will become more and more a part of the program of civic development. After all is done that can be done, however, streams flowing by large cities will inevitably remain polluted to an unavoidable extent. This much must be accepted. But he who wilfully or carelessly permits the preventable pollution of a pure stream offends against the highest ideals of society, the ideals of health, of purity, and of decency.

A portion of the water which falls to the earth as rain, finds its way by seepage to that great body of water known as the ground-water. It may later emerge as a spring, rejoining the surface waters of running streams, and in dry weather the surface water may replenish the diminished ground-water supply. This ground-water is doubly protected against pollution. It is for the most part out of reach of ordinary pollution being safely hidden beneath the soil.

Furthermore the soil is Nature's filter and exerts a wonderful, purifying action whereby a polluted surface water, upon entering the ground, is cleansed of its objectionable impurities. So for ages the spring, issuing from the mountainside, has been regarded as the emblem of purity. But again man's ignorance and interference have undone that which was good. The concentration of polluting material, and especially of that most dangerous material, human excrement, within the surface layer of the soil, overtaxes the natural purifying resources of the soil and permits the passage of unpurified and dangerous pollution into the body of ground-water below. This is always the case with any kind of privy which permits its contents to seep directly into the ground, and especially so with the deep pit privy. The water in the vicinity will become polluted and any nearby shallow well, which is merely a hole reaching down into that slowly flowing underground stream, will draw from that pollution. A deep well, which is the technical name of a well passing in a tight casing through the upper water-bearing strata, and through an impervious clay or rock stratum, to lower underground streams, is almost always sufficiently protected. The waters which it reaches come from remote distances, and any initial pollution will have been removed during their passage. Only in limestone formations, where the deep waters may be true underground streams, flowing for miles in open tunnels and caverns, is there danger from remote pollution. The safety of a deep

well depends of course upon the tightness of its casing and the complete exclusion of nearby shallow drainage. A flowing well gives positive evidence of the exclusion of drainage from any lower level than its outlet.

Surface streams, ponds and shallow ground-waters are therefore subject to pollution, and their use for drinking and domestic purposes is offensive to the sense of decency. But much more can and must be said against them. Contagious and infectious diseases are transmitted from one victim to another, from the sick to the well, by means of germs or bacteria. These germs most commonly enter the body by the mouth or nose, in food, drink or the breath, and, multiplying enormously, are discharged in the excreta. This is especially true of that most dreaded and most common of the so-called water-borne diseases, typhoid fever. Water, polluted, however slightly, with human excrement, may contain the germs of disease. Surface waters, brooks and ponds, and shallow wells near dwelling houses, may be so polluted and may carry disease. The presence of pollution is not detectable through the senses, for a very dangerous water may be sparkling, clear and sweet in taste and smell. All such waters therefore, however innocent in appearance, may be dangerous and are to be avoided.

They should be avoided not only for drinking, but also for any use in connection with uncooked food, such as the washing of green vegetables. For dish washing also it is of first importance that only pure or boiled water be used.

Boiled Water is Safe.

But of course most of us must use such surface or shallow-well waters, for deep ground-water is not always to be had. Fortunately we may eliminate the danger by one or another device. The simplest, most readily accessible and surest of these devices is heat. If water be heated until it just boils all dangerous germ life will be destroyed. Boiled water is safe water. There is none safer. Whether upon the farm, in camp, or in a city having a suspicious water supply, this simple safe-guard is open to all. *Boil the Water and Kill the Germs.*

Cities have other remedies, more costly to install, more difficult to operate, and not one bit better. These devices are filters, assisted by various coagulants and disinfectants. The type of filter and the nature of the treatment vary from place to place and from time to time according to the character of the water. A properly designed and operated filter may render even a badly polluted water hygienically safe and pure. The water of Washington although but little polluted in the first place, being taken from the Potomac above the Great Falls, is thus treated and is of the first quality. Many other cities are equally well protected. Others, less fortunate, furnish to their citizens and guests, unfiltered and unpurified river water. Epidemics of typhoid fever, high infant mortality from intestinal disturbances, and high sickness and death rates characterize these cities. The so-called "summer

typhoid" or "vacation typhoid" is but one measure of the imperfect sanitary condition under which travelers and vacationists are forced to live. Fortunately these conditions are being recognized and remedied, and those who may choose the course of their travels or select their summer vacation resorts will do well to make thorough inquiry into the sanitary conditions of the places they would visit.

The large city filters must not be confused with the little so-called filters often offered for sale by pedlars or others. There are few, if any, of these devices that will be of any advantage to a domestic supply. Certainly none of the cheap affairs which screw onto the faucet are of the slightest value. With careful operation certain of the more expensive types, employing fine porcelain tubes, are efficient; but for a household device to treat a dangerous water some form of heat treatment, automatic boiling or distilling apparatus, or disinfection by ozone or ultra-violet light is to be recommended.

Some of the standard brands of bottled water are carefully looked after and safe. Unknown brands and especially all local bottled "spring waters" are to be looked upon with suspicion in the absence of definite information as to their source and manner of handling. Most of them furnish little guarantee of original purity, while the opportunity for contamination is great. Sterilization of the bottles is a first essential, for they are often taken direct from the sick room to be refilled and redistributed.

Avoid Public Drinking Cups.

The drinking water furnished on trains and steamboats, engaged in interstate traffic, is now under the supervision of the U. S. Public Health Service.

Finally there is danger between the faucet and the lips. Pure and safe drinking water, run into a cup just used by a tuberculosis person may carry to the lips of the next user the germs of tuberculosis. The same is true of diphtheria and many of the diseases of children. The public drinking cup is fortunately passing away and will soon be no longer known among decent people. Collapsible metal cups for travelers and the ready accessibility of bubble fountains and of individual paper cups in most places make it possible to avoid this danger without inconvenience. In the schools, even after the abolition of the public cup, it is necessary to constantly warn against the "borrowing" of the private cup, a too common practice.

In summary then:

Surface water, ponds and brooks, may be polluted.
Shallow-well water may be polluted.
Polluted water may contain the germs of disease.
Boiling the water kills the germs.
Boiled water is safe water.
Well filtered city water is safe water.
The purest water in a public drinking cup is dangerous.

RUPERT BLUE
EARLE B. PHELPS

HEALTH RULE IV

Tuberculosis, typhoid fever, and other diseases are often caused by drinking raw milk and raw cream.

Get milk properly pasteurized, or home-pasteurize it, or simply scald it.

All cream, including that used for ice cream and butter, should be properly pasteurized to be safe.

Diseases often attack us through food. The purposes of this chapter are to show that milk is the most important food in this respect and to define what we must do to escape the dangers that menace us through its use.

Milk is an exceedingly delicate and complex liquid secreted by mammals for the nourishment of their young. It contains, in easily digested combinations and admirable proportions for the needs of young mammals, everything we must derive from food to remain alive and well. Though the milk of every species of mammals contains all the essential elements of food, that of each species is particularly suited for its young; hence, the milk of cows is the best milk for calves; that of mares for colts; and that of women for babies.

Nature provided that milk should pass directly from the body of a mother into the mouth of her young,

without previous exposure to air, dust, milk utensils, the hands and other parts of milkers, variations of temperature or anything that may contaminate it or change its character. Used in this way, the milk of a healthy mother is a perfect food, and every healthy mother should strive to feed her baby in the natural way.

No one who knows how much commoner sicknesses and deaths are among artificially or bottle-fed babies than among those fed in the natural way can doubt that every mother should look upon feeding her baby in the natural way as a sacred duty. It is claimed by those who have studied the subject that ten bottle-fed babies die to one fed in the natural way.

Milk removed from the animals by which it is secreted through other means than the mouths of their young varies enormously in quality. It may be a very valuable and safe or a positively dangerous food, and just which it is depends upon the amount and character of the impurities it contains and the changes it has undergone.

Impurities and changes that our senses can detect should lead us to discard milk at once as unfit to enter our mouths. We must use our senses to protect our health; our eyes, noses and tongues should make sure that our food looks, smells and tastes right. To reject milk which shows a sediment or a deposit on standing, or is unnatural in its appearance, odor or taste, is a wise and urgently necessary precaution. But this alone does not give us sufficient protection, as

the more serious dangers that menace us through milk remain hidden until their presence is demonstrated, too late, by the harm they have done. These dangers are, expressed in one word, bacteria.

In addition to being an excellent, nutritious food when pure and fresh for babies, older children and adults, the use of which should be encouraged and increased and not discouraged, milk is also a nearly perfect food for bacteria, or those microscopic, vegetable organisms commonly spoken of as germs, and many of which are true disease germs. Nothing we use as food is a more favorable medium for the growth and multiplication of bacteria. Milk contains the nourishment bacteria require, dissolved and ready for use, and, as milk is opaque, it hides the germs from view and shields them against light or their greatest natural enemy.

Bacteria may be divided into three classes, as follows: Those probably harmless; those harmless in small but dangerous in large numbers, and those always dangerous and more so as their numbers increase. One class can not be distinguished from the other in the short time between milking and the use of milk as food.

The total exclusion of bacteria from milk is impossible. The freshest, purest and best milk from a healthy cow or other mammal contains a small number. The small number, swallowed by a young animal with milk obtained from its healthy mother in the natural way, do no harm, but in milk which is not

immediately swallowed they may increase with surprising rapidity. For example, milk with only 10 bacteria per cubic centimeter (about 16 drops), at the beginning may contain over 60,000 per cubic centimeter after it has been kept at a comfortable room temperature 24 hours, and over 3,500,000 per cubic centimeter at the end of 40 hours.

Cold checks and warmth hastens the multiplication of bacteria; hence, milk should be cooled quickly after it is milked and kept cold until it is used. It should also be kept covered, to exclude dust, flies and other impurities. Dust and dirt contain many bacteria and the bodies of flies are filthy.

After milk has been delivered by a dealer we must not imagine the multiplication of bacteria in it stops. Unless it is kept cold and covered, though its quality is excellent at the time of delivery, it may not be wholesome food a few hours later. The dairyman or dealer cannot be held responsible for what happens to milk after it has passed beyond his care, and milk with only a reasonable number of bacteria at the time of delivery, unless it is kept cold and covered, may contain over 400,000,000 per teaspoonful 24 hours later.

Unfortunately much milk is left at the houses of consumers early in the morning and not taken in until several hours later. When this is the case provision should be made to have it so placed that the sun cannot shine on it and animals, like dogs and cats, cannot reach it.

The supposedly harmless bacteria and those harmful in large numbers should be controlled in milk by care and cleanliness; by having only healthy and clean animals in dairy herds; by stabling such animals in clean and well ventilated stables and providing good pastures for them; by feeding them wholesome, clean food; by having clean, pure water supplies on dairy farms; by cleaning dairy utensils in a way that kills bacteria; by insisting on the greatest cleanliness of person and habit among dairy employees; by making the time between milking and the delivery of milk to the consumer as short as possible; by using every reasonable precaution to guard milk against contamination and the multiplication of those bacteria in it that cannot be excluded, or, plainly, by using up-to-date, approved methods in the production and distribution of milk and proper precautions to keep it pure and wholesome after it has been delivered.

Impure, bacteria-laden milk, even when it contains no bacteria of the class known as true disease germs, is dangerous. Strong, vigorous persons, whose resistance to disease is high, often use it without being noticeably affected by it, but this is not true of babies, delicate persons, invalids and those whose resistance to disease is low. The strong and vigorous do not truly escape; their resistance to disease, like that of more delicate persons, varies from time to time, and when it is low the use of bad milk is very apt to cause real sickness. The truth of this was convincingly illus-

trated at a large military school, in which no one is accepted as a student without passing a rigid examination for physical soundness. A change in the milk used at the school from ordinary market milk to milk produced under strict, sanitary supervision, at once greatly reduced the time lost by the students through sickness. If exceptionally vigorous, healthy students, of an age when resistance to disease is greatest, and who, as in the case here referred to, live regular, normal lives and are guarded against indulgence in weakening and injurious habits and practices, can have the amount of sickness they suffer increased or diminished by the quality of the milk they use, we are forced to conclude that no person can afford to risk the exposure of his or her health to bad milk. The available evidence truly proves that those who, seemingly, are not harmed by bad milk would be more efficient if they used only good milk, and that those whose health is impaired reduce their chances for recovery when they use bad milk.

And now we must give our attention to the dangers often hidden in milk which cannot be sufficiently controlled by care, cleanliness and watchfulness, and which must, therefore, be fought with corrective, as distinct from preventive, measures.

In the sense that the more serious dangers often hidden in milk may be spoken of collectively by using one word, "bacteria," the greatest of all dangers that menace health through milk may be defined by the term, "disease germs."

The difference between the three classes of bacteria, the harmless, those harmful in large numbers and the true disease germs, is parallel to the difference between three substances, for example, like sugar, alcohol and arsenic. Sugar is harmless, though we can make ourselves decidedly uncomfortable by eating too much of it. Alcohol is widely used with too little thought that it is a real poison, although most of us know that it is best to avoid it and that its excessive use causes all manner of suffering. And arsenic is a poison about the dangerous character of which no reasonable person is uncertain.

Various facts we should know about disease germs in milk are as follows:

1. True disease germs, like those which cause tuberculosis, typhoid fever, diphtheria, scarlet fever, infectious sore throat, infantile diarrhœa, etc., may be fatally numerous in milk without changing its taste, odor or appearance.

2. True disease germs occur in milk so frequently that thousands of cases of tuberculosis and hundreds of epidemics of other diseases have been traced directly to infected milk. The suffering, the loss of time and money, the reduction in human efficiency and the number of deaths caused by the use of raw, infected milk are preventable evils which no one acquainted with their magnitude can contemplate without horror.

3. Fatally serious epidemics have been traced directly to milk produced and distributed by dairies widely recognized as models of perfection. Milk can be kept free from dirt and too many ordinary bacteria, but we lack the knowledge required certainly to exclude true disease germs from it.

4. Persons and animals, from whose bodies disease germs are expelled in a way that leads to the infection of milk when such persons are engaged in dairy work or such animals are members of dairy herds, may be considered as belonging to several groups, as follows:

   a. Those who show recognizable symptoms of infectious diseases. To safeguard milk against infection through such persons and animals is possible.

   b. Those who are in the early, so-called incubative stages of infectious diseases, or the stages which precede the development of symptoms. To safeguard milk against infection through such persons and animals is absolutely impossible.

   c. Those who are apparently healthy but actually and often actively affected with infectious diseases. To some extent milk is being safeguarded against infection scattered by such persons and animals, but its protection is, and will long remain, wholly inadequate.

d. Those who suffer mild attacks of infectious diseases which are passed over as unimportant, simple illness or inconsequential, little indispositions. It is impossible to prevent the infection of milk through such persons and animals.

e. Those who have recovered from infectious diseases but continue to harbor disease germs in their bodies. Thousands of cases of disease, with many deaths, have been traced directly to milk contaminated by such persons.

f. Those who escape infectious diseases because of their high resistance to them but whose bodies are invaded by disease germs. Persons and animals of this class are very numerous; it is impossible to prevent the infection of milk with germs that multiply in and are expelled from their bodies.

g. Persons who carry disease germs on their hands, clothing, etc., because they have been in contact with sick relatives and friends. Infectious diseases among the relatives and associates of dairymen and dairy employees have been revealed through the diseases and deaths caused by infected milk.

5. By far the greater number of disease germs expelled from the bodies of persons and animals die or lose their virulence before they can reach

the bodies of new victims, and most healthy persons have enough resistance against disease to escape harm from the penetration of only a small number of disease germs into their bodies. Even guinea pigs, which are among the most susceptible of all animals to tuberculosis, escape without harm when they are exposed to not more than a score or two of tuberculosis germs. If this was not the case disease germs would have depopulated the world long ago.

6. Disease germs on the floors and walls of houses, on tables and chairs, in floor coverings, books, wearing apparel, etc., have a location which does not insure their introduction into our bodies; they menace us; too often harm us; but, on the whole, they are only on their way to our bodies by a path that more commonly ends elsewhere. And remember, they do not multiply on the way. Disease germs in dust and air are so intensely exposed to the sterilizing effects of light that it is only in dust from rooms occupied, or recently occupied by diseased individuals, and in the air in the close vicinity of such diseased persons that the presence of bacteria is to be feared. How dust and bad air injure health is defined in another chapter.

7. In milk, on the other hand, many kinds of disease germs multiply; the few that may not harm vigorous, healthy persons become the many that

break down normal resistance to disease, and often the very many that break down extra-normal resistance, and in the place of being on a path that is more likely to end elsewhere than in our bodies, they are located in a vehicle that compares favorably with an express train that is certain to reach its destination.

8. The presence of disease germs in milk, if the milk is obtained from apparently healthy animals under good sanitary conditions, and is otherwise clean and fresh, can be deprived of its importance and danger by the use of one, simple, inexpensive expedient. The expedient is pasteurization.

To pasteurize milk means to heat it to a degree of temperature not high enough to change its taste or affect its quality as food, for a sufficient length of time to kill disease germs.

Among the various disease germs that seriously menace us through milk, tuberculosis germs can bear exposure to heat longer than other kinds, and they are killed in milk by heating it to 140° F., for 20 minutes. At a somewhat higher temperature they are killed in less time. Hence, if milk is heated to 140° F., for 20 minutes or longer, all the true disease germs it is likely to contain are made harmless.

Much milk is pasteurized before it is sold, but this should not be accepted as safe until we have informed ourselves through careful inquiry that it is properly

pasteurized by a reliable dealer. No supervision over commercial pasteurization, or pasteurization by dairymen, exists in the District of Columbia, and tests of commercially pasteurized milk have shown that it occasionally contains virulent disease germs. Until commercial pasteurization is guarded by official supervision, unless pasteurized milk can be obtained from a reliable dealer, the proper thing to do is to buy the best obtainable raw milk and to pasteurize it at home.

If it is too much trouble to use a thermometer to measure the degree of heat, or a clock or watch to measure the length of time during which heat is applied in pasteurization; that is to say, if proper pasteurization at home is too burdensome, milk can be made safe by simply scalding it, or bringing it to nearly the boiling point. After pasteurizing or scalding milk it should be cooled and kept cold and covered until it is used.

Those who are properly informed about bacteria, particularly true disease germs, and their occurrence in milk, and who know that health is a possession of incalculable value, will not permit a drop of raw milk to pass their lips.

As all dairy products derived from infected milk are unsafe it is necessary, before concluding the chapter, to say a few words about cream, ice cream, butter and cheese.

Raw cream, either in the form of cream or ice cream, is as dangerous as raw milk. Cold does not destroy disease germs; it only checks their multipli-

cation. Food is not kept cold to improve it but simply to prevent it from spoiling and becoming unwholesome through the multiplication of bacteria in it. Bacteria, disease germs included, remain alive after long exposure to a lower temperature than the lowest obtainable in an ice-cream freezer.

Butter and cheese have not been proved to be important agents, like raw milk and raw cream, through which diseases attack us. We know, positively, through laboratory tests, that a considerable proportion of the butter and cheese sold by dealers is contaminated with disease germs, but whether the germs are sufficiently numerous or virulent to constitute a serious menace to health remains questionable. It is not the object of this chapter to inspire unreasonable fears or to give possible and probable dangers unwarranted importance. About raw milk and cream we know that the dangers to which laboratory tests first called attention have been proved to be real and fatally serious. The evidence is abundant, practical, direct and irrefutable.

In addition to pasteurizing all milk at home for the present, or restricting ourselves to the use of milk pasteurized by a reliable dairyman, we should strive for laws requiring the pasteurization, under competent official supervision, of the entire milk supply.

A controversy has long raged concerning the relative food value and digestibility of raw and heated milk, in which the hygienists have taken one and many physicians the other side. To some extent this con-

troversy remains active, with the hygienists and an increasing number of physicians, opposed to the use of milk in its raw state on one side, and a decreasing number of physicians, who continue to oppose the use of heat to make milk safe, on the other.

No one now seriously claims that raw milk is one iota better than pasteurized, scalded or boiled milk when it is used as a food by persons older than unweaned infants, and the available data prove that pasteurized cow's milk is a safer, a better and a generally more wholesome food for unweaned infants than raw cow's milk.

ERNEST C. SCHROEDER

SLEEP

HEALTH RULE V

Get enough sleep.

Sleep with windows open or, better still, outdoors.

The health rules of the Association for the Prevention of Tuberculosis are particularly designed to be of use to the pupils of our public schools. The boys and girls of any city are its chief asset and pride. Sound minds and sound bodies go hand in hand. "Get Plenty of Sleep" is a wholesome maxim. Sleep is a requirement,—not an elective in nature's curriculum. The new born infant needs to sleep twenty hours out of every twenty-four. The amount required gradually grows less until at two years of age, fifteen hours may be sufficient. With growing boys and girls a generous amount of sleep is still necessary. The rapid body growth of children between the ages of ten and sixteen makes heavy demands upon their nervous and physical resources. This drain can be met in part by regular habits of sleep for at least eight hours a day. Nine and ten hours are even better for the average boy or girl, and not a few grown-ups require as much.

What is known as fatigue is caused by the generation of certain waste products in the body—due to mental and physical exercise. These products must

be eliminated. During the hours of sleep when the heart action slows down and the ordinary mental and physical activities are at rest, the production of these wastes is greatly diminished while their elimination continues. These wastes, if not thrown off, play havoc with the nervous system—producing restlessness and irritability, which, if not checked, are liable to bring about a nervous or mental collapse.

Insomnia, or the inability to sleep, is nature's danger signal to slow down! If the warning is unheeded, health is liable to be wrecked and the mind become affected.

One of the evils of overcrowded living conditions among the poorest of our people is the lack of privacy for quiet sleeping. Cooking, eating, living, working and sleeping go on in two or three rooms. The effect on the children of the family is liable to be bad. One's rules for sleep should be plenty of it—taken at regular intervals—in privacy when possible, and with windows open, or better still, out of doors.

This brings us to the second part of the Health Rule under consideration.

We have spoken of fatigue as occasioned by certain waste products due to physical and mental exercise. These wastes must be eliminated. In addition to the rest and sleep required for their elimination, plenty of oxygen must be taken into the lungs, in order to burn up certain of these products. The effect of oxygen upon body wastes is best seen when the wastes are in such excessive amounts as to en-

danger the life of the sufferer. Thus a chief feature of the modern treatment of nervous prostration, pneumonia and tuberculosis, as well as other diseases, is a plentiful supply of fresh air or oxygen. As a current of air is necessary to fan the spark into a flame in order to consume household waste, so oxygen is an essential for the combustion of wastes generated within the human body.

The advantages of outdoor sleeping are many. First, one is assured of breathing fresh or unused air. Individual air is quite as desirable as individual towels, individual combs, individual tooth brushes and individual drinking cups. The old prejudice against "out of door air" at night is now known to be groundless. Night air, especially in our cities, is freer from dust and smoke and gases than day air. During the mosquito season, the sleeper should be protected by screens or netting.

Let us have the best night air possible. Most houses and many apartments now being erected in this climate are provided with porches. Watch the newspaper "ads" of new houses and observe how sleeping porches are featured in these advertisements. Unfortunately, there is still a prejudice against outdoor sleeping. Many persons dread the exposure. With plenty of bedding, one need have no fear of catching cold. The cold complained of by many who have tried sleeping out of doors in winter is due not to lack of covering, but to lack of protection from the cold that penetrates through the mattress. Additional

protection may be obtained by the simple device of placing a heavy woolen blanket or a comfort made of padded newspapers between the spring and the mattress. An advantage of outdoor sleeping in cold weather as compared with sleeping in a room with windows open is that one may come into a warm room to dress where the air is fresh and unbreathed.

Another advantage of outdoor sleeping in winter is the tonic effect of the cold air. There is more oxygen in a cubic foot of air at freezing point than there is at blood temperature. This increased oxygen burns up body waste and the products of fatigue more rapidly. Circulation is stimulated—digestion is stimulated—and one awakens refreshed and ready for the day's work. The mental stimulus, for example, of fresh air school rooms, as contrasted with poorly ventilated school rooms, has been demonstrated again and again.

No one who has ever camped out will deny the benefit he has derived from life in the open. Why not get the benefit of outdoor living the year around by sleeping out of doors or if this is not possible, at an open window or as near the open window as may be.

Moving air is a better tonic than still air. Moving air is most readily obtained out of doors. Anyone may try the experiment of opening the windows and watching the effect of air currents upon movable objects within the room, like draperies or curtains. The agitation is in the inverse ratio of distance from the window.

WASHINGTON HEALTH RULES

Practical experience has demonstrated that living in the open air is one of the important means whereby anaemic persons, nervous invalids or sufferers from lung trouble may regain their health. Such persons gain in weight, and pallor gives place to rosy cheeks, indicative of improved circulation. By sleeping out of doors, any one whatever his occupation, may spend at least one-third of his time in the open air. A gain of weight and health in the case of persons below normal is almost sure to follow, while resistance to nose, throat and lung troubles, as well as other diseases is increased.

WALTER S. UFFORD

KEEP CLEAN

HEALTH RULE VI

Take a bath or sponge daily, and a warm bath, followed by a cold splash, plunge, or shower, once or twice a week or oftener.

Use soap freely.

Wash your hands before handling food.

Don't put fingers, money, paper, or pencils in your mouth.

Don't bite your fingernails.

Cleanliness is a virtue which is not inherent in human kind and must therefore be taught, by precept, and example, like other virtues. When cleanliness is not an acquired habit it may even be a much objected to nuisance. We find this in particular the case with youthful humanity; the fact is that every healthy child is a savage, who craves playing with dirt, enjoys digging ditches and shoveling hills, and delights in those rare privileges of youth, the making of mud pies and the wading in a flowing gutter, shoes off or on doesn't matter.

To show that cleanliness is an acquired element of civilization we need only to behold what an acute punishment a scrub or a tub bath is to the average boy. Nay, there exist whole nations who honestly think that frequent bathing is not a social duty and who defend themselves by the specious argument that you

can reach a hale old age even though you reduce washing the body to the minimum and that it is not natural for human kind to wash, except, maybe, the uncovered portion of the body, the face and hands.

And there is not the least doubt but that one might go through a long life under a regime of cleanlessness, provided only that one selected healthy and contented parents and thereby acquired without effort such a robust constitution as would permit all kinds of trespasses against hygiene with impunity. In fact, if everybody inherited this naturally high resistance to the ills of flesh there would be scant use for Health Rules, though it would probably be found that even a Roosevelt can withstand greater hardships and lead a more strenuous life because he adds to a rare native ruddiness the fortifying elements of hygienic living.

Yet there have been many men of genius who were oblivious to the care of the body, but we may assume that their lives would have been greater, of longer duration and more perfect had they harbored their transcendent souls in what the human body is when at its best, a temple of nature, born to charm and beauty, and which can be kept perfect under the benign and illuminating rays that are shed by the precepts of an advancing civilization.

When the spiritual ideals that arose in Palestine are linked to the religion of the body such as prevailed in ancient Greece, then may we behold those highest types of manhood and womanhood which the human race is capable of producing and which, in

an encouraging way, it does bring forth in ever increasing numbers. Clean persons are healthier and more efficient as a rule than dirty persons, and vastly more attractive.

Cleanliness became easier of accomplishment when soap was invented. The mixing of oil or fat with an alkali, the latter, as a rule, slightly in excess, produces ordinary soap. It may be scented by perfumes and colored by dyes and all animal fats or vegetable oils lend themselves to the making of soap; even the so-called fatty acids contained in resins, gums or waxes may yield soap when mixed with a proper alkali.

When soap is dissolved in water it forms suds or lather, and the alkali which is thereby set free may then be used for making further soap by combining it through rubbing with the fatty film which at all times covers the human body. It would be difficult to remove this film by water alone but when it is first transformed into soap, it can readily be washed off in water. We could use the alkali alone for washing ourselves, but we would often use too much of it and the advantage of good soap is that it is made with such a slight and definite surplus of alkali as will not injure the skin and draw out of it too much of its natural fat. The skin would often be left too dry for comfort were we to wash ourselves with the alkali alone.

The hygienic value of washing with soap is obvious. In removing the fatty film which covers our skin, and which is constantly developed by it, we remove

with it the dirt, dust and bacteria which have stuck to it. After washing, the skin remains clean for a while; then more fat and perspiration exude from the body, more dirt, dust and bacteria stick to it and washing becomes again necessary. When once people have acquired the habit of frequent washing and bathing they will feel uncomfortable and guilty of negiect if circumstances prevent them from indulging in the blessed practice. In particular do our hands require frequent washing with soap because we handle with them all kinds of objects covered by dust, dirt and bacteria and much sickness is caused by direct or indirect contact between people some of whom may be indifferent to cleanliness. Some of these may belong to the so-called disease carriers because having been sick with an infectious disease they continue to eliminate the germs of that disease, and it is fairly proved that a certain percentage of such people remain carriers for a lesser or longer period. Washing our hands before handling food is therefore desirable both from the esthetic sense and out of hygienic consideration. For thousands of years washing the hands before eating was a religious duty among Jews and it was accompanied by a special form of a blessing. And this enforced habit undoubtedly added to the wellknown vitality of that ancient people. Among the old Romans and Greeks bathing was a cult which was encouraged by the government. Visitors to Rome stand in wonder when they behold the ruins of what were once the Baths of Caracalla which could accommodate many

thousands of people at one time. Cold, tepid and hot baths were provided and their use was undoubtedly free for all the people.

But it is with cleanliness as with other hygienic injunctions. We may often disregard them and escape punishment, but we never know when we may have become susceptible and sensitive to infection, when overwork, loss of sleep, improper food, worry or intentional neglect may have broken down our vitality or our natural resistance to disease. When this happens to be the case, a single mouthful of food which was handled by soiled fingers may convey enough virulent disease germs to our mouth to throw us on the sickbed for weeks, often forcing us to fight for our very life with the last shred of an impaired vitality. Putting money, paper or pencils into our mouth is likewise to be censured because it is clear and has often been proved that they may convey infectious diseases after having been handled by a number of people. For this reason also should kissing children on the mouth never be tolerated because children are in particular susceptible to infections at all times and should be shielded against disease germs conveyed by contact with careless or even wellmeaning but unsuspected people.

The health rule which is covered by this chapter recommends that a warm bath should be followed by a cold splash, plunge or shower. During immersion in hot water the pores of the skin open up and the temperature of the skin rises to the temperature of

the water, or higher in a vapor or hot air bath. This is the reason why the native Russian or Indian emerging from a steam bath can enjoy running directly out into the snow and rolling around in it, finding this practice both exhilarating and healthful.

The skin being a poor conductor of heat and cold it is affected by the snow only in the outer layers and there is enough heat stored up in the layers beneath to protect the interior of the body and the vital organs, so that no harm can come to them. On the other hand the terminals of the nerves and pores through which the skin acts receive a wholesome stimulation and reaction into a particularly healthful state by a species of temperature massage and produce a remarkable glow over the whole body, a sensation of youthfulness and vigor not easily obtainable by other means equally harmless. This it is which makes a cold splash, plunge or shower after a hot bath so beneficial, but when persons are thin of body and not covered with plenty of tissue they may find a sudden change of temperature unpleasant and experience a shock. For these it is advisable to apply the cold water action gradually but ending it with water ranging between 50° to 60° F. the average temperature of river or hydrant water.

Rubbing the body with alcohol after a hot bath is also useful for the purpose of hardening the skin against sudden changes in temperature.

A skin so treated regularly will easily tolerate an occasional cold draft or the exposure to inclement

weather; it will help protect its owner against common, so-called colds, which often result from breathing close and impure air or that laden with house dust. Many so-called colds are due to germs which have lodged and proliferate on the mucous membranes of nose, mouth, throat and larynx. They can be readily avoided by observing the instructions laid down in Health Rules I and VI.

Viewed simply as a protective envelope, the skin is highly efficient. It is tough and elastic, and thickest and firmest where the greatest strength is required. When it is sound and free from abrasions, scratches, punctures, cuts and other wounds, it is practically impervious to disease germs. When it is clean, the little injuries to which it is liable generally heal rapidly, but when it is dirty and the dirt contains dangerous bacteria, which is often the case, little injuries may lead to evils ranging in severity from slight festering sores to severe inflammations, or to the development of abscesses, ulcers, and even blood poisoning. In this connection we should bear in mind that varieties of bacteria exist which may be swallowed with impunity but which are very dangerous when they pass under our skin or into our circulation through a wound. Such bacteria are so common that it is fair to assume they are always present in dirt.

Biting fingernails is a habit for which it is not easy to find a good explanation. It begins usually before children enter school among such as are of a restless or apprehensive disposition. Early attention to chil-

dren affected with the habit is necessary to break them of it. Keeping their nails well trimmed down at all times should help and so should an appeal to personal pride by holding hands with bitten fingernails next to such that are not bitten.

Teaching, enforcing and practicing cleanliness is a duty we owe society for the same reason as the teaching, enforcing and practicing of other virtues. It certainly will have its own reward, in better health, in a wholesome regard and respect for the wonderful organism of the human body and in raising the esthetic ideal of spotlessness which is as much a part of pure living as the observance of strictly moral codes and commandments.

We must keep clean to meet the requirements of civilization; we must keep clean to be presentable to refined and educated persons; we must keep clean to avoid diseases, notably those through which we may become a menace to our relatives, friends, associates and the community in which we live, and we must be clean in body and mind to truly merit the rank of American citizens.

EMILE BERLINER

FOOD

HEALTH RULE VII

Don't eat food that has been exposed to flies or dust, or touched by unclean hands.

Raw fruits or vegetables so exposed should be rinsed or washed thoroughly.

Chew your food well.

The influence of dust upon foodstuffs is determined primarily by three factors: First, the quantity of the dust. Second, the composition of the dust. Third, the nature of the foodstuffs. Three factors operate secondarily: First, time after the exposure of the foodstuff to the dust. Second, temperature. Third, humidity. These secondary factors may be of the utmost importance in determining the condition of the foodstuff at any given moment, but they are not germane to the purposes of this paper.

Quantity of dust. The quantity of dust in any given place is determined by the character of the adjacent surfaces, the materials upon them, the disturbances to which such surfaces and materials are subjected, and the extent and character of prevailing air currents.

Composition of dust. The composition of the dust found in any place depends upon the materials of which adjacent surfaces are composed and the nature of the substances deposited upon such surfaces. The ordinary dust of the street, market, store, kitchen, and

dining room is made up of inorganic matter, which may be classed roughly under the popular phrase, "mineral matter"; dead organic matter, possibly better described popularly as dead animal and vegetable matter; and living microorganisms.*

Classification of foodstuffs. Variation in the character of foodstuffs, and resultant variations in the processes to which they are subjected before being eaten, must be considered in determining the effect of exposure to dust. Food may permit or even require the entire removal of the outer surface before it is eaten, as in the case of fresh fish, crabs, and watermelons; or such treatment may be impossible, as in the case of lettuce and berries of all kinds. Food may always be cooked before being eaten as in the case of fresh fish; or it may never be cooked, as in the case of lettuce. Food may be easily decomposable, as in the case of shucked oysters; or it may decompose only under the most favorable circumstances, and then slowly, as in the case of nuts. Food may be brought to the market in a comparatively clean condition, as in the case of bread; or it may be uniformly and necessarily dirty, as in the case of potatoes, beets, and radishes. Food may have been fully prepared for the table and subject to contamination after the last cleansing and cooking process has been completed, as in the case of pies; or it may, as in the case of undrawn poultry, require each and every cleansing and cooking process before

*The word "microorganism" is used in preference to the word "bacteria," since it covers all varieties of microscopic life; for instance, molds.

it can be eaten. It is impossible here to describe the influence of all such circumstances, and of varying combinations of them, in determining the effect that exposure to dust will have upon individual varieties of foodstuffs. It is manifest, however, that no hard and fast rule can be laid down with respect to the matter.

Quantity of dust in its relation to foodstuffs. The presence of large quantities of dust upon food of any kind renders it undesirable for human consumption, and it would hardly be stretching the point to say that dust in large quantities renders food actually unwholesome, even without reference to the composition of the dust. For we know that food grossly dusty—or grossly dirty, and that amounts to the same thing—is revolting to the appetite; and we know further that if the appetite revolts at any food, such food is eaten with less relish and is less easily digested. If the dust has not affected the composition of the food and can be removed without injuring it, the food may be cleansed and then eaten with impunity, at least if the fact that it was dusty or dirty be not known to the consumer. But if the character of the food be such as to prevent the removal of the dust without injury to the food, or if the dust contain ingredients whose bare presence is revolting to persons of ordinary refinement, as certain excrementitious matters, then the food has lost permanently something of its wholesomeness and soundness. For civilized men and women, of ordinary refinement, food must be clean or

at least believed to be clean, or else it lacks something of its normal relish and digestibility.

Inorganic dust in its relation to foodstuffs. The inorganic or mineral matter found in dust consists of minute particles ground from street and road surfaces, and other like matter. Much of it is insoluble. When deposited upon food it has no power of increasing in quantity, materially changing its character, or by combining with the food to give rise to harmful substances. In so far as this particular ingredient of dust is concerned, it is from the standpoint of food practically harmless, except as it may make the food less appetizing.

Dead organic matter in dust, in relation to foodstuffs. The dead organic matter that forms one of the elements of which dust is composed is made up of particles of leaves, straw, hay, and other like things, and fine particles of animal matter from wool carpets, the surface of the skin, etc. In the city, no inconsiderable part of this material comes from the manure that has been deposited upon the street, and which has dried and been pulverized by passing feet and passing vehicles. Like the inorganic matter, it has no power of increasing in quantity; but it may be changed in character by the action of the microorganisms that the dust contains, and it enables such microorganisms to multiply. In itself, such dead organic matter has no injurious influence upon the health of the person consuming the food upon which it happens to fall.

Its presence, however, if recognized, tends materially to diminish the relish with which the food is eaten.

Microorganisms in dust, in their relation to foodstuffs. Microorganisms are invariably present in the ordinary dust of the street, market, store, kitchen, and dining room. The number present under ordinary conditions is, however, much less than is popularly supposed; and, again contrary to popular belief, the presence of disease producing germs among them is not frequent. Varieties that tend to decompose foodstuffs are common. From a public health standpoint, the microorganisms in dust are the most important element in it, since they can increase in number after they have been deposited upon food and some of them even after they have been swallowed, and such increase causes changes in the food and possibly gives rise to disease. The exact nature of the changes that occur depends upon the nature of the microorganisms and upon the nature of the foodstuffs, but concerning the exact nature of the changes that may be expected in any particular case it is difficult and commonly impossible to speak in advance, owing to our ignorance of at least some of the controlling factors.

While the facts that any given article of food must be peeled or shelled, or the outer covering otherwise discarded, and that the food may or must be washed or cooked before being eaten, have an important bearing upon the sanitary relations of dust generally, they are particularly important with refer-

ence to the microorganisms the dust contains. In the first place, the natural protective coverings of vegetables, fruits, fish, poultry, and game limit very much the ability of such microorganisms to find their ways into the interior of such foodstuffs; and in the second place, even though such outer coverings be not removed before or at the time the food is eaten, thus carrying the contaminating microorganisms with them, they render possible much more thorough cleansing than could be otherwise effected.

Ordinary cooking processes may be relied upon very generally to destroy such microorganisms as have found their way on to the surfaces of foodstuffs as an incident to marketing and preparation for the table, particularly such as have lodged upon the surfaces of fruits and vegetables. Unfortunately, however, in some cases of bacterial contamination of meats and fish, cooking fails to accomplish this result, and serious and even fatal poisoning ensues. Such cases were formerly designated as cases of "ptomaine poisoning," and are popularly still so named; but as ptomaines, so-called, are no longer believed to be the active factors, the name is a misnomer, and such cases are now, for want of a better name, called simply cases of "food poisoning."

From what has been said, it is manifest that the greatest danger that arises through the bacterial contamination of foodstuffs is that which occurs through the happening of such contamination in the kitchen or the dining room; or at least that which happens

after the foodstuff has been finally prepared for the table, as in the case of bread, cakes, and pies, after they have been taken from the oven.

Conclusions. Dust is composed of inorganic matters, dead organic matter, and living microorganisms. If it is present on foodstuffs in large quantities it may offend the appetite and thus interfere with the normal consumption and digestion of the contaminated food, no matter what the composition of the dust may be. Ordinarily, however, the inorganic and the dead organic matter may be regarded as negligible elements in the composition of dust, in so far as relates to the soundness and wholesomeness of foodstuffs. Such danger as arises is commonly due to the microorganisms present. These may act by causing the foodstuff to undergo decomposition, thus rendering it less palatable, less digestible, and possibly less wholesome or even positively poisonous. Microorganisms from dust may act also by causing specific diseases, like typhoid fever, when the contaminating microorganism is the causative agent of such a disease; but this is rarely the case. Safety lies in the discarding of the outer parts of all foodstuffs that have been exposed to contamination, thorough cleansing and thorough cooking; but when these safeguards are impracticable, owing to the nature of the foodstuff, the prevention of contamination is the only means of safety. Prevention of contamination may, moreover, well supplement peeling, washing, and cooking, so as to guard against any possible failure in their appli-

cation. Reasonable regulations for the protection of foodstuffs from dust, while they are exposed for sale, are, therefore, justified. Precautions within the household are essential.

Contamination of Food by Flies.

The influence of flies upon foodstuffs may be manifested directly in three ways: First, the fly may "blow" the food—that is, deposit its eggs upon it. Second, the fly may deposit microorganisms that cause decomposition. Third, the fly may deposit microorganisms that cause disease. The aesthetic relations of the fly to food can not be ignored, however, at the present time, when everyone is familiar with the filthy habits of this insect and the mere fact that flies have been on food tends to make it repulsive to persons of ordinary refinement.

Fly-blown food. The influence of the eggs of the fly and even of the maggot is more or less localized, and the limits of the space affected may be easily determined. Sometimes, therefore, the affected part of flyblown food may be removed and the rest used. If, however, the mass of the food involved is small, it may be necessary to discard it in its entirety. The objection to the use of flyblown meat is aesthetic, since there is no disease that can be attributed to the use of such food. As has been stated above, however, food that is repulsive to the aesthetic sense and to the palate is eaten with less relish than is other food, and, according to modern observations, it may, therefore,

be less easily digested than is food that appeals to the appetite.

Fly-borne microorganisms in their relations to food. The microorganisms a fly deposits upon food stuffs are taken up by the fly with its food or are simply such as happen to adhere to the feet, legs, and other parts of the fly's body. Microorganisms taken up with the fly's food may pass through the fly's digestive tract and be deposited upon foodstuffs in fly-specks. Such microorganisms as adhere to the feet, legs, and other parts of the fly's body are transferred by mere contact to the foodstuffs which the fly touches. The effect of such microorganisms, however deposited, will depend upon the variety, and upon the nature of the foodstuff. A fly can not, however, deposit any microorganism that will cause any specific disease, such as typhoid fever, unless the fly has first picked up the germs of that particular disease, and outside of the bacteriological laboratory these are always derived from a patient suffering from that disease.

The idea of eating fly-specked food is itself disgusting, since fly-specks are the filth discharged from the fly's body, and this disgust is increased by a knowledge of the fact that the very food that the fly takes into its stomach is so often filth of the nastiest kind. The fly's habit of feasting on such filth is responsible, too, for the spread of disease through the fly, since it is by visits to all kinds of discharges from the bodies of human beings that the fly gets the disease germs that it carries. A fly that has feasted on the dis-

charges from a patient suffering from typhoid-fever, and possibly on the discharges of patients suffering from other communicable diseases, or which has dragged itself over such filth, may convey the disease by which it has been contaminated.

It is impossible to distinguish flies that are dangerous by reason of having been in contact with such dangerous filth, from flies that have not been so fouled. For this reason, and because of the nastiness of the habits of all flies and the physical discomfort that they cause, there is only one safe rule to follow: *Exterminate the fly.* And until the fly has been exterminated, endeavor by strictest cleanliness to render the home, the restaurant, and other places where foods are kept, uninviting to the fly and keep out by careful screening such flies as attempt entrance.

Food and Unclean Hands.

Human hands constitute the greatest source of danger in relation to the spread of disease through food other than milk. Hands come into contact with so many things and are called upon necessarily to perform so many duties with respect to the daily toilet of each person that they are exposed on many occasions to contamination by the germs of disease—of typhoid fever, tuberculosis, diphtheria, and so on. These germs may remain on the infected hand for considerable periods of time, and then pass from the hand to food that is about to be eaten. If the food contaminated by such hands is not at the time in a

state that requires some subsequent cleaning or cooking process that will effectually sterilize it, disease may result. In view of the fact that much of our food is necessarily handled by persons engaged in serving it, even after having been cooked, and much of it comes into contact with the hands of the consumer when he eats it, there remain many opportunities for the contamination of food after all cleaning and cooking processes are at an end.

Cleanliness of the hands of all persons having to do with the preparation and serving of food, and cleanliness of the hands of the consumer himself, are imperative if health is to be properly safeguarded.

Chew Your Food Well.

Solid food must become fluid before it can enter the blood and nourish the body. This change is brought about by the digestive juices that nature provides for that purpose. These digestive juices bathe and permeate the entire mass of food within the digestive tract, but they can act on any individual particle of solid food only from the surface. In order that the digestive juices may act as speedily as possible on each and every particle of food within the digestive tract, each such particle must be reduced to the smallest possible size, so as to increase its surface area in proportion to the bulk it contains. The process is identical with that which we follow when we desire to dissolve rapidly any solid substance, and the reason is the same in both cases; we cut it up or break it up into

the smallest pieces practicable, so that the dissolving liquid may best attack it.

For the subdivision of food, nature has given each of us a set of teeth and two strong jaws, but frequently we eat in such a hurry that we do not use them. Then the digestive juices can not act as rapidly as they should, and the food either remains too long in the stomach, where it ferments, or, before it has been properly prepared it is passed into the intestines, where similarly objectionable changes occur. If the food eaten is very indigestible and the particles in which it enters the stomach are large, we may have an attack of acute indigestion, with all of its attendant discomfort and dangers. If the food is not of such an indigestible character, or if the failure to chew it is not so great, then no harm may result from a single error, but if such faulty chewing becomes a habit, then chronic indigestion must be expected as the result.

Not all indigestion is due to failure to chew food properly, but it is safe to say that very much of it is due to this cause, most frequently chronic indigestion; but there is no sense in running the risk of any indigestion whatsoever simply to save a few minutes at meal time or for the sake of getting into the stomach within a given period more food than can be properly chewed within that time. *Safety Lies in Efficient Chewing.*

WILLIAM C. WOODWARD

BREATHING AND EXERCISE

HEALTH RULE VIII

Breathe through your nose.

Practice deep breathing.

Sit and stand erect. Take plenty of outdoor exercise, but avoid excess in athletics; it may cause heart trouble.

Don't eat or drink when overheated by exercise.

Why do we breathe through the nose?

Because the nose is intended by nature to convey a column of air into the throat and through this onward to the lungs.

How do we know this to be a fact?

Primarily, because the nose is the only permanently open highway in the body which leads to the lungs through the throat.

Secondarily, because within the nose are placed certain structures which through the performance of their normal physiological actions so modify and prepare the inspired air as to make it suitable for pulmonary respiration.

Why should we not breathe through the mouth?

The mouth is not a breathing passage, but a food passage. As in the nose we have the structures for preparing the air for proper pulmonary respiration, so in the mouth we have the structures to receive and prepare the food for proper gastric digestion.

Secondarily, the mouth is not a permanently open highway. From a bacteriological point of view this is important, as bacteria multiply freely in the mouth but not in a healthy nose. At birth we are so constituted that the various organs and systems of the body, if they are normal, perform their functions automatically, as it were, and in proper correlation one to the other. Deformities or malformations may impair, alter or arrest the functions of any organ or system.

To what extent does deformity in the nasal organs impair the process of breathing?

We may have a congenital deformity in the nose, that obstructs completely the nasal passages to the conveyance of air.

What is the result on the new born infant of such a condition?

It demonstrates the fact most conclusively that the nose is intended for breathing; and that breathing through the nose is the natural habit of man. It also demonstrates the fact that mouth breathing is an acquired habit.

An infant born with complete obstructions to the nose will suffocate, as many do, unless they acquire themselves, or are taught to acquire, the habit of breathing through the mouth. Such a child will tighten the lips, draw in the cheeks, struggle violently, and become profoundly blue in the face until when forced to cry out with pain, it will gain air through the mouth, thus giving it temporary relief. With the

temporary relief the mouth is firmly closed and the process is repeated. Many in this condition die from exhaustion before they realize that they must keep the mouth open to breathe, or are assisted by their elders in acquiring the habit.

We have now demonstrated that the nose is the proper channel through which air passes, and have also demonstrated that mouth breathing is an acquired habit.

Why is it essential that we breathe through the nose?

Because in the nose the air which we breathe is prepared for pulmonary respiration by being warmed, moistened, and freed from coarse material therein contained as well as bacteria. It has been amply demonstrated by experiments that the inspired air, at whatever temperature the surrounding air may be, is brought up to nearly the temperature of the body in its passage through the nose. This function of the nose is so nicely regulated that on a winter day although we may be at one moment in a room with a temperature of seventy, the next moment in an outer room with the temperature at forty, and a few moments later in the open air with a temperature at twenty, or lower, the air at all these intervals is received into the throat at a temperature nearly equal to that of the body temperature. The air we breathe also varies in its degree of humidity. All inspired air absorbs moisture in its passage through the nose. It has been amply proved through physiolog-

ical experiments that the nose secretes a pint of fluid every twenty-four hours that is not appreciated as moisture within the nose, which is utilized in moistening the inspired air in its passage through the nose. It is well known even to the layman that the nose arrests most of the impalpable foreign matter that is contained in the inspired air. This fact may be demonstrated. If, after passing through a dust or smoke laden atmosphere, one wipes out the vestibule of the nose, he will find it surcharged with the dust or soot which has been therein arrested. From the above fact it must be recognized that the air in the first act of respiration should not take its course through the mouth, that the nose is the only organ that is capable of preparing the air for pulmonary respiration; the mouth containing none of the essential structures for this purpose.

What is the result of imperfect nasal breathing or complete mouth breathing if maintained continuously?

The individual so affected becomes much more predisposed to acute and chronic affections of the lungs and bronchial mucous membranes; he is also very prone to affections of the windpipe and larynx; he is also markedly susceptible to acute and chronic catarrhal affections, and suppurative diseases of the middle ear; and frequently to marked alterations in the development of the bones of the face, resulting in undue arching of the hard palate and alteration of the outlines of the alveolar process so that there is insufficient

space for the development of the teeth with deformities as a result of the imperfect alignment of the latter.

How should one maintain nasal breathing?

One with normal nasal passages should have no difficulty in maintaining nasal breathing and breaking the habit of mouth breathing if he will resolutely strive to keep his mouth closed during waking hours, except while eating or talking. If one cannot, through this simple means break the mouth breathing habit, there must be some intermittent or constant swelling of the soft tissues, new growth, overgrowth of normally existing tissue, or bone deformities which require correction by a medical expert.

How does the manner in which we stand and walk affect our health?

The maintainence of the erect position with the head well poised and the shoulders drawn well back, not only adds to the physical grace of man, but is also essential for his physical well-being. In the athletic field as well as in the army the erect carriage is considered essential to obtain the full and free action of all the organs of the body so that when under pressure they may act with such freedom of function as to be under no strain. In athletic training and in military service is this fact so well recognized that the first efforts of the trainers or the drill master are directed towards the correct carriage of the new recruit. The slouching habit is ungainly, unattractive and ungraceful. It has also the additional disadvantage that it impairs the action of the important in-

ternal organs of the body. The drooping of the head tends, although slightly, nevertheless continuously to impede the return flow of blood from the head. The forward bent chest and depressed shoulders prevent the proper expansion of the lungs and necessary inflation of the pulmonary vesicles. The sagging of the abdomen allows the stomach, liver and intestines to fall forward with tendency to ligamentary relaxation, thus impairing their functions, and indeed occasionally causing displacement of these organs.

What does an erect carriage of head and body add to our life?

It cannot be impressed upon the young too strenuously that an erect carriage adds grace, dignity and physical beauty to an individual. It makes a clear head, a courageous mien and a better outlook upon the world, all of which are in great part due to the better cranial circulation, the more perfect aeration of the blood through improved pulmonary circulation and the more stable action of the taut visceral organs.

What are the advantages of outdoor life?

The out-of-door life has been so thoroughly brought to the attention of the public by the physician through preachment and example, and has been so thoroughly taken to heart by the public that it hardly seems necessary to give extended consideration to this point, were it not that every generation brings forth a certain proportion who coddle themselves and avoid all so-called physical exertion and outdoor life. The breathing of fresh uncontaminated air is essential for the proper

aeration of the blood. The more oxygen in the blood the better is the functional activity of every organ in the body.

In what manner is exercise most beneficial?

In open air exercise the benefits are obtained to the greatest extent. Under the stimulus of increased muscular activity, the lungs expand to their full extent and there is a more rapid and thorough change in the residual air in the lungs. All exercise, whether in the open or within doors should be of a pleasurable character, and have some definite object in view. It should not be carried to excess and should never be of a violent character. Excessive exercise carried to the extent of athletic competition is frequently harmful in that when maintained over long periods it may give rise to hypertrophy. or dilatation of the heart.

What should be observed regarding eating and drinking before and after exercise?

It is well to bear in mind that the partaking of food and the drinking of water should not be indulged in immediately after active or violent physical exertion, when the body is overheated and fatigued, and that we should not take violent exercise immediately after eating or drinking. Always rest and cool down after exercise before eating and drinking. Do not attempt to cool down quickly by exposure to drafts of cool air, or by reclining upon cool or damp ground when overheated and fatigued from exercise.

CHARLES W. RICHARDSON

CARE OF THE TEETH

HEALTH RULE IX

Clean your teeth in the morning and at bedtime; use a brush and prepared chalk.

Teeth decay principally during the night.

A quarter teaspoonful of Milk of Magnesia taken without water and kept in the mouth, just before retiring, will help to preserve the teeth. This applies even to young children.

Teeth should be frequently inspected by a dentist.

The object of this chapter is to give to teachers and pupils instructions and reasons for proper care of the mouth, or, as it should be more properly called, the oral cavity.

It is the right of every human being to have as perfect teeth as animals, and when living in an uncivilized native state this is usually the case, but centuries of civilization have taken away the uncooked and coarse food of the aborigines and given us instead much cooked, machine-prepared and predigested food. When no resistance is offered the teeth in the act of mastication or the food is swallowed whole, the teeth do not get their share of work and they will deteriorate in the same manner as any other part of the body when not exercised. One should chew food well, because not only is thorough mastication a great help

in the preservation of teeth but besides helps digestion by mixing the food with plenty of saliva.

The oral cavity consists of the lips, teeth, tongue, mouthcavity and all mucous membrane surfaces surrounding these parts. An unclean condition of the oral cavity may be the cause of a great many ailments, especially of the alimentary tract, of which the mouth is the opening. If the mouth contains decayed food particles, or bacteria, the act of eating and swallowing will convey them to the alimentary canal and may produce sickness. Parents and teachers are doing good work when teaching cleanliness to the children, but a child or adult can not be considered clean if the teeth are covered with a green stain or mucus, or if they are decayed and have abscesses.

The care of the oral cavity should begin with the infant. Before each feeding the little mouth should be carefully swabbed out with a mild antiseptic solution like boracic acid. When the first tooth appears it should be cleaned every day, and the use of the tooth brush can begin at the age of eighteen months or two years. The mother or nurse should use the brush at a regular time each day in order to form the habit.

The greatest care should be given the temporary teeth as upon them depend the regularity of the permanent teeth and the features of the child. There are twenty temporary or deciduous teeth coming through or erupting from six months on, and these should be given the same care as to cleaning, treating, and filling, that is given the permanent teeth.

The next teeth to appear are very important. They are the first permanent teeth (called the first or six year molars) and their position is directly behind the temporary teeth. There are four,—two upper and two lower,—which erupt at the age of six years. These teeth are many times mistaken for temporary teeth and should be watched closely, as their loss means a deficiency which cannot be supplied at that stage of the child's development. As the rest of the teeth erupt, the temporary teeth are thrown off or exfoliated until the entire set or denture is completed at twelve years, excepting the wisdom teeth, which generally make their appearance between the ages of seventeen to twenty-five.

If the mouth of the child shows any tendency toward irregularities, a competent dental practitioner should be consulted at once. One of the most common of these irregularities which can be avoided is the abnormally high arch, due to thumb and finger sucking and the use of the so called pacifier. This condition is also said by physicians to be the cause of adenoids. If regulating appliances are worn to correct these conditions extra care should be taken, because the bands and bars of the appliance give lodgement to large amounts of food rests or debris. This also applies to the adult who wears bridges or plates—immovable or removable. Food particles left in these localities ferment and putrefy very rapidly owing to the warmth and dampness found in the mouth and the product of such fermentation is largely lactic acid,

which is the great destroyer of lime phosphate or the inorganic portion of which teeth consist. *If an extracted tooth be immersed in a dilute solution of lactic acid for several days it becomes soft, showing the same action which takes place in the mouth when containing the acid. The treatment of this condition will be considered later.*

The method of cleaning the oral cavity is simple but unless there is definite technique used the effort may be wasted. First friction must be made with a brush and a paste or powder that will polish but not abraid the enamel. The brush selected should be small and of sufficient stiffness for the bristles to be forced into the interdental spaces at the necks of the teeth thereby scraping off the so-called mucous placques. These placques are small particles of mucus that are impregnated with lactic acid. As they cling to the teeth they hold the acid in contact with the enamel, causing disintegration and decay. The brush for the small child should, of course, be very small and the bristles not too hard.

The teeth must be brushed on all surfaces, using a steady rotary motion, brushing the upper teeth down and the lower teeth up. To brush across the teeth only is not sufficient, as only the high spots are then polished and the spaces between the teeth remain untouched.

The part that is hardest to cleanse is the upper back teeth, where the cheek is tight. In a mouth that is carelessly cleaned, food, mucus and tartar can always

be found in this location. The proper way to brush this part is to insert the brush in the mouth and close the lips lightly upon the handle, leaving the cheek loose, thus giving the brush plenty of room to pass entirely around the upper back teeth. The lower back teeth are easily cleaned by brushing the tops and sides, length-wise and cross-wise.

In cleaning the inside of the teeth be sure and brush from the palate to the teeth, also the tongue and all mucous membrane surfaces that can be reached without discomfort.

In addition to water a good dentifrice advised by the dentist, or plain prepared chalk, must be used. By a dentifrice we mean a powder or paste to be used in conjunction with the tooth brush to mechanically clean the teeth.

So called antiseptic mouth washes are usually not efficient, because to kill bacteria of the oral cavity, they would need to be corrosive enough to destroy healthy tissue. But it has been found that a mouth wash of a decided alkaline reaction, such as milk of magnesia or lime water, is advisable for the following reasons: Food particles between the teeth before they decay will, as stated before, ferment, producing lactic acid, which, as has been shown, disintegrates the enamel of the teeth. This disintegration takes place before the tooth decays. The proper time to brush the teeth is night and morning, especially at night. If then the alkaline mouth wash of milk of magnesia or lime water, mentioned previously, be used, it will pre-

vent or retard decay better than any other method. In the case of milk of magnesia the alkaline coating clings to the teeth for a number of hours, preventing the action of the lactic acid upon the enamel as the acid action is greatest during sleep when the mouth is still and the saliva is not secreting and washing the acid away. Milk of magnesia should be used nightly.

The method of using the alkaline mouth wash is simple. After the teeth have been thoroughly brushed take a small quantity of milk of magnesia, say a quarter of a teaspoonful, in the mouth, swallowing any small surplus. A protective coating covering the surfaces of the oral cavity will remain, and will, for a number of hours, neutralize the lactic acid thereby preventing decay.

The use of floss between the teeth is of great benefit, as the interdental spaces can be thereby thoroughly polished. The floss should be fully carried up between the teeth and worked back and forth until the enamel has been polished. Great care should be taken not to force the silk up into the gum tissue. Wooden or quill tooth picks may be injurious to the gums if wedged in too tight or when not fresh and clean. Pins, needles or metal toothpicks should never be used.

When there are broken or abscessed roots and teeth in the oral cavity, they should be treated or removed by a competent dentist as in these roots bacteria are developed and have been found to cause infections which extend throughout the entire body. There are a

great many persons who are in deadly fear of infection when they have a sore on any part of the body but the same persons will allow broken and carious teeth to cut the tongue and cheek, opening the way for malignant disease.

Stomatitis—so called canker sores—is another evidence of the uncleanliness of the mouth, usually accompanied by disturbed digestion.

It is only by constant teaching and reiteration that the child or adult will accept the precepts of mouth hygiene as they do those of the cleanliness of the body in general.

ALLAN SCOTT WOLFE

LIQUOR AND TOBACCO

HEALTH RULE X

Avoid tobacco and liquors. They are especially injurious to the young.

There is good reason for this advice. I believe there is no doubt in the minds of competent experts, devoid of prejudice, regarding the soundness of this admonition. Tobacco is undoubtedly injurious to the young. Personally I would go still further than this and include grown people also. I doubt if tobacco ever did anyone any good, except the farmer who grows it and the railroad that carries it and the manufacturer who prepares it for the market and the merchant who sells it. I might include in this, also, Uncle Sam, who collects quite a revenue from the tax on tobacco. I am not one of those who believe, however, that the citizens should suffer harm to swell the contents of Uncle Sam's purse. As long as people continue to use tobacco I believe in its taxation, but I wouldn't encourage its use in order to increase the national revenues.

The bad effects of tobacco are of two kinds: In the first place, it excites an unnatural flow of saliva, thus placing a burden upon the salivary glands, which ought to be reserved for the needs of nutrition. It is a fundamental principle in physiology that a gland or an organ of any kind, in order to perform its normal

function, must be properly kept in action. There is another fundamental principle of hygiene and physiology, however, which is just as important, namely, that overexertion of an organ or a gland is quite as injurious as a lack of exercise. In so far as the excretion of saliva is concerned, the normal foods which we eat are quite sufficient to give the salivary glands their normal exercise. Any additional stimulus, especially between meals, cannot fail of being injurious. Thus tobacco should be condemned on the same score as chewing gum, namely, as an unnatural excitant of the glands, thus interfering with their normal functioning.

Another indictment, however, holds against tobacco, namely, that it contains an extremely poisonous alkaloid, nicotine. I need not go into any discussion here respecting the chemical nature of nicotine, nor its rank among poisons. It is universally admitted to be a poison. When nicotine is ingested into the body, and even in the mouth, it is absorbed into the blood and is eliminated principally by the kidneys. In the opinion of some writers on poisons, complex chemical decompositions of nicotine occur in the stomach and from these there is a resulting transformation of the gastric juices, which combined with nicotine are more poisonous than the simple tobacco bases themselves. It is of little importance whether this theory is true or not. The well-known phenomena of violent poisoning, especially in the case of those not accustomed to the use of tobacco, are matters of universal knowledge.

As little as one grain, sixty milligrams, of nicotine is considered a fatal dose. Unfortunately, also, nicotine is absorbed with great rapidity. Therefore in cases of intoxication by nicotine there is scarcely any possibility of the successful administration of a remedy. The amount of nicotine contained in tobacco varies with the locality. In American tobacco about two per cent is found; in Algerian tobacco about eight per cent. Many fatal cases of poisoning from tobacco have been known among children, either from swallowing tobacco or from playing with old pipes. As small an amount as one milligram of nicotine, when swallowed, produces an unpleasant sensation in the mouth and throat, an excessive flow of saliva, and an uncomfortable feeling extending from the region of the throat to the extremities of the body.

It would seem that no argument is necessary to guard against the use of such a dreadful poison. It is true that in the ordinary use of tobacco, either by chewing, smoking or snuff-taking, relatively small quantities of nicotine enter the circulation. This is extremely fortunate from one point of view, for otherwise beginners in the use of tobacco would usually end their career suddenly. The severe illness which attends the first attempts to use tobacco, especially in the case of the young, is a universal evidence of its poisonous quality. Whatever method of ingestion be selected, the effect is usually the same.

The continued use of tobacco, beginning with very small quantities and increasing to the usual amounts

employed, begets in the victim a toleration of the poison, which often is so complete that very large quantities of tobacco may be used in the ordinary methods without producing any of the immediate symptoms of poisoning. The user of tobacco, however, who says it doesn't hurt him, and there are hundreds of thousands of them who say this, is thoroughly deceived. The development of the tobacco heart, the production of neuroses, trembling of the hands, the tendency to produce cancer of the lips, the mouth and the throat, are all well-known activities of tobacco, which are manifested particularly in those who use it for a long period.

In so far as youth is concerned, and I mean by that up to the age of twenty-one, there is only one safe course, namely, prohibition. If the youth reaches twenty-one without forming the habit, he may be regarded as safely launched on a tobaccoless life. And most fortunate is that boy or girl, now that women are commencing to use tobacco, who enters upon his career free of the bondage of the tobacco habit. For health, decency and respect for the feelings of others, such a career is most desirable.

The Rule also mentions liquors. By that I infer alcoholic liquors. The same precautions which have been mentioned in respect of tobacco for the youth apply with almost as great force to alcohol. I say "almost as great" for this reason: The tendency to use alcohol by the youth of the country is far less threatening and extensive than the use of tobacco.

LIQUOR AND TOBACCO

Alcoholic beverages have become so thoroughly discredited among the people, the cause of temperance and the principles of prohibition have gained such headway, that large numbers of our youth are now brought up without being exposed to the acquirement of the alcohol habit. But still there are many who are subjected to this danger, and it is for those especially that I write.

Alcohol is not so violently toxic as tobacco, and its toxicity shows entirely different aspects as a rule. While alcohol can easily produce death, its first effects are those of pleasurable exhilaration, and this is one of the dangers in connection with its use. It is not so much the taste or flavor of the beverage which is seductive as it is the effect upon the feelings. This of course is true also of tobacco, though not to such a marked degree. Alcohol, like tobacco, is always a poison. Unlike tobacco, it has some food value. In other words, a part of the alcohol ingested, if not in too great quantities, will be burned in the body and furnish heat. To this extent it is a food; but it is a most expensive food. Quite as much heat would be furnished by burning the sugar or starch from which the alcohol is manufactured.

Tobacco has one advantage over alcohol in this, that as a rule, it is not ingested directly into the stomach. Alcoholic beverages, on the other hand, are ingested directly into the stomach, so that the full effect of the intoxicating powers of alcohol are produced. The most pathetic phases of humanity are those in which

we find human beings slaves to a dangerous habit, usually a drug habit. Among these the tobacco and alcohol habits are the leaders in so far as numbers are concerned. Other drugs, such as cocaine and opium and its compounds, have their legions of slaves, but in the case of tobacco and alcohol there is almost at times, a nation-wide mobilization of their victims.

Therefore, while the alcohol habit has fewer devotees, it produces upon the whole far more misery and unhappiness. Tobacco makes ill, but does not degrade. Alcohol excites the worst passions of man. In the use of tobacco one does not lose the use of his mind. In the use of alcohol in excess all sense of responsibility ends. Alcohol is, therefore, far more destructive than tobacco.

Alcohol has far-reaching effects on the system. The children of those devoted to the use of alcohol people the asylums of the imbecile and the insane. The continued use of alcohol affects some of the vital organs of the body, especially the liver. While we speak of a tobacco heart, we should not forget the alcohol liver. In reply to the claims that are made that the moderate use of alcoholic beverages that are pure and old tends to improve the health and is especially useful in old age, I may say that there is no sufficient clinical proof to verify the statement. I, for one, am not of that opinion, but even granting that it is true, we should leave to the physician the administration of articles of this kind rather than to threaten injury to the great mass of mankind. I, for

one, cannot see how any kind of an alcoholic beverage would tend to prolong life. On the other hand, victims of the alcohol habit are more liable than others to contract tuberculosis, pneumonia, and other infectious diseases and their chances of recovering are greatly diminished.

One of the chief dangers in connection with alcoholic beverages is the use of adulterated articles, which are far more injurious than the genuine articles. The country is flooded with so-called whiskey, brandy and rum, made from alcohol by means of flavors and colors. Wine, especially sweet wine, is dosed with sugar, thus greatly increasing its alcohol content to the injury of the consumer. Beer is made from glucose, so-called grape-sugar, and low grade sugars, and from unmalted cereals, when it should be made only from malted cereals and hops. Thus the degradation of the beverages, cheapening them, produces a greater consumption of a much more injurious material.

But even in the case of the genuine articles that are properly aged I can see no excuse for their use, especially among the young. Alcohol, like tobacco, should be *"malum prohibitum,"* an evil forbidden to youth, and I would also add that in so far as I can see the same rule should be applied to those of mature age.

HARVEY W. WILEY

DON'T NEGLECT COLDS

HEALTH RULE XI

Do not neglect coughs or colds.

If you do not get well soon, go to a doctor or dispensary for treatment.

Never cough, sneeze, or breathe in another person's face.

Don't spit on floors or sidewalks.

The popular term "Catching Cold" would often be more expressive of the real condition if it were changed to catching germs, which aptly denotes the contagiousness of the disease as well as its proper source.

Colds depend on one or more of three factors, first, contact with germs; second, lowered resistance; and third, an exciting cause, such as drafts and sudden change of temperature. Bacteria which produce colds are so prevalent that every precaution should be taken to avoid them. One should stay away from all places of crowded assembly, such as ill-ventilated stores, theatres, churches, street-cars, etc. Persons who lead out of door lives are less susceptible to colds than those whose work confines them indoors, for that reason the hygiene of one's home or working quarters is of the greatest importance. The temperature of school rooms should never be allowed to go over 68°.

An efficient method of ventilating a room in cool weather is to lower the upper sashes a few inches or more. This will cause a continuous flow of fresh air into the room between the two sashes, and the exit of contaminated warm air at the top. The introduction of fresh air not only serves to increase our supply of oxygen, but may often also supply the humidity which is so necessary and so often lacking in our modern dwellings. The absence of a proper amount of moisture not only has an enervating effect on the whole system, but it dries the mucous membrane of the upper respiratory tract, causing irritation and congestion, thus producing favorable soil in which bacteria may grow and produce disease.

As coughs and colds are often contagious, children having such symptons should be excluded from school until they have recovered. Acute colds of the upper air passages occurring in a family, should entail isolation as far as possible for individuals so afflicted, as it has been found that a fine spray of germ laden mucus is thrown off for a distance of several feet in the act of coughing, sneezing or laughing. This spray remains in the air for some time, thus affording a favorable opportunity for contact with the mucous membranes. When coughing, sneezing or laughing, a handkerchief should be held to the nose and mouth to catch the discharge; the excretions from coughs and colds which may contain billions of pathogenic organisms are also disseminated by expectoration. Sputum is dangerous at all times, and when

dry is converted into dust which is scattered in the atmosphere by the wind, by sweeping and dusting, thus contaminating air and food exposed to it. Most pathogenic organisms retain their vitality for long periods of time in dampness, darkness and dirt. Sunshine, light and drying destroy them; for that reason house dust is very much more dangerous than street dust. The possibility of carrying particles of sputum into the home on one's shoes and clothing and thus conveying the infection must also be taken into consideration. The direct rays of the sun kill the tubercle bacillus which is the cause of the Great White Plague, in a comparatively short time. A war on dust in our homes would be a war on pathogenic germs and consequently on disease. Dry sweeping or dusting with a feather duster does not really clean; it simply disturbs the dirt, throwing it out into the air so that it can be readily inhaled. The vacuum cleaner, damp cloths, and specially prepared dusters should be our weapons of attack. To prevent dust contamination, careless expectoration should be avoided. Any one who has a sufficient accumulation of mucus in the upper air passage to make it necessary to expectorate, must have some diseased condition of the mucous membrane and should seek medical advice. Spitting, due to habit, is excessively vulgar and should not be tolerated. Spitting in public is forbidden by law in a great many States. The discharges from the mucous membrane should be received in cheese cloth, paper handkerchiefs or paper sputum cups which should be

destroyed by fire. The complete destruction of the abnormal secretions of the respiratory tract would result in a great reduction in the frequency of a number of diseases that are now a scourge to mankind.

Lowered resistance, another factor in colds, is of equal if not of greater importance than contact with germs. One's resistance is of two kinds; natural and acquired. Natural resistance is that which is transmitted by one's ancestors. We may inherit either a family immunity or a predisposition to certain diseases, just as we inherit certain features, dispositions or traits. For example, tuberculosis is not an inherited disease, but it is conceded that a favorable soil may be transmitted which when infection is introduced may lead to a rapid and fatal termination.

Acquired immunity is that which we obtain by hygienic living, *i. e.,* pure air, sunshine, good food, proper clothing, exercise and sufficient sleep. There are certain protective influences in the body that we can increase and develop by keeping our systems in the highest possible state of physical condition, so that disease germs are harmless even if they obtain entrance. When, owing to general conditions, these mucous surfaces have lost their normal tone, when extreme changes of temperature, drafts, wet clothes, fatigue mental and physical, have caused local congestion, then a suitable soil has been furnished for dormant bacteria to become active, to develop and produce disease.

A persistant cough should be considered a red-

flag, a danger signal to seek competent medical advice. A cough may be due to diseased conditions of the nose, throat, heart, lungs or kidneys. It may be the beginning of tuberculosis, which can only be arrested in the initial stages. The proper care of the respiratory mucous membranes, the proper destruction of mucous discharges, the prompt and early treatment of all diseased conditions of air-passages not only prevents one from becoming a menace to the community, but assists materially in assuring long life to the individual.

WILLIAM C. GWYNN

SUNSHINE

HEALTH RULE XII

Admit plenty of sunshine into your houses and into your lives.

Cultivate cheerfulness and kindliness; it helps you to resist disease.

Your mind acts on your body.

Glorious winter sunshine is about us today. It floods the ship. It lights up the fleecy clouds. It shines from the great heaving expanse of the ocean. It fills our hearts with cheer.*

Physical sunshine is one of the therapeutic agents about which all practitioners agree. Physicians of every school are apt to say to a man needing medical advice, "Now get out into the air and sunshine."

Whatever else he is to do or not to do, sunshine is usually added to the cure.

There is a very definite scientific basis for this belief in sunshine.

In his work, "Infection and Immunity," General George M. Sternberg says:

"As long ago as 1877 two English experimenters (Downes and Blunt) in a communication made to the Royal Society of London presented evidence showing that sunlight has an injurious effect upon bacteria,

(*) Written on shipboard en route to Belgium to assist in work under the American committee for the relief of the Belgians.

and that sterilization of cultures in liquid media could be effected by prolonged exposure to direct sunlight. Since then many experiments have been made by different observers and the fact has been fully confirmed. The distinguished German bacteriologist, Dr. Robert Koch, reported, some years since, the results of his experiments with the tubercle bacillus. He found that the time required to kill this bacillus varies from a few minutes to several hours, depending upon the thickness of the layer exposed. Even diffused daylight exerts a certain germicidal action, although the time of exposure is very much longer—five to seven days for the tubercle bacillus. In the writer's experiments made in 1892 it was found that two hours' exposure to direct sunlight was fatal to the cholera spirillum suspended in a liquid medium.

"It has been ascertained that the rays at the violet end of the spectrum have the greatest disinfecting power, while the red rays are comparatively inert.

"The facts stated fully sustain the popular idea that the exposure of infected articles of clothing and bedding in the sun is a useful sanitary precaution, and is to be commended as a routine practice in domestic sanitation; and also as an additional and supplementary precaution when infected articles have been subjected to the action of other disinfectants."

The germs of disease "love darkness rather than light," not only "because their deeds are evil," but because sunshine means sure death to them.

Nearly everybody can have sunshine. The supply,

for all practical purposes, is inexhaustible. The physical benefit of exposure to the sun is incalculable. Nothing but ancient prejudice and superstition keeps us from swimming in it as we should.

There is a lot of nonsense written about danger from exposure to the direct rays of the sun. Like the superstition about night air, this superstition dies hard. There are times of intense summer heat when it is wiser to follow the example of the inhabitants of the tropics and keep out of the sun for a few hours in the middle of the day. But, personally, I have never seen such times even in Washington during July and August. I feel better to be out in it than lying back in the darkness dreading it.

In a majority of cases so-called sunstroke occurs in persons who have been imprudent as to overeating or overdrinking or overwork or worry. Many a child is ruined for life by adoring parents who insist on shielding it from the sun and who teach it from babyhood to rush madly to draw a hanging, if sunlight threatens curtain or carpet. If it is a choice between the color of a cheek or the color of a carpet, wise parents will choose the cheek. Sunshine is a tonic.

One thing for which a tuberculosis patient ought to be very thankful is this: The things relating to a cure are among the choice things of life. "Such a regimen," said a harassed business man who didn't have tuberculosis, "would give me a chance to get acquainted with the world." To sit and bask in the sunshine, a thing intended to be part of the life of every

normal man, is crowded out for most of us by the pressure and rush of modern life.

In trying to get over a diseased condition, there is little use, however, sitting out in physical sunshine if the mental state is dark or askew. There is no use of emptying the life of labor if immediately seven devils of worry are to rush in and take possession. A man had better go on and work till he drops, than submit himself to the tortures of unhappy moods or of a worried mind.

I speak of this as a matter of choosing and so it is. Nobody need be unhappy. Nobody need worry. It is simply a question of mental self-control. "Two kinds of things," said a modern writer, "I will not worry about—the things I can help and the things I can not help. If I can help them, I will. If I can't help them, what is the use?"

In a mass of literature on mental healing, there is one practical rule of immense assistance to all who want to stop worrying. Put something else in your mind. Make yourself think of something else, of sheep, camping, embroidery, beefsteak, Bibles, anything of interest to you, and the worrying thought will be crowded out.

What we can not help, is not our job. To get well if we are sick, is our job and it is a man-size job,—not a job for mollycoddles. If a man hasn't any faith in the universe, he can keep his faith in courage, and with every swelling impulse of courage comes a gleam of mental sunshine.

SUNSHINE

Every true man hates hypocrisy, but there is something to be said in favor of trying to appear cheerful whether we feel like it or not. It is so noble a counterfeit, and so unselfish, that it frequently ushers in the reality. It makes others sunny and their sunshine is reflected back upon us.

All this is fundamental. No cure is possible for physical ill, if it be tied up to a mind bent on worry.

As well sit in doors all day, and ship all the fresh eggs to market and eat only the little a jaded appetite will accept, as to work up an appetite in the air, and have the best of food and then block all progress by unrest, unhappiness, rebellion, sorrow, gloom.

It would seem as if every discordant thought created toxins, poisons that undermine our natural resistance to getting sick and as if every sunny thought created anti-toxins, helping to increase this resistance.

Mental and physical sunshine are essentials possible to everybody, without which all the sanatoria and camps and home cures are only half efficacious.

To cultivate cheerfulness and kindliness is a duty we owe to ourselves and to our neighbors. Banish the small thoughts, think broadly and generously, and let the sunshine of a contented and sympathetic heart light up the face which turns to greet the world around you.

JOHN VAN SCHAICK, JR.

WASHINGTON HEALTH RULES

I.
GOOD AIR

Avoid badly ventilated, badly lighted, dusty, dirty, overheated, crowded or damp rooms.

II.
AVOID HOUSE DUST

Breathing dust, notably house dust, often causes disease. Have no tacked down carpets and mattings. Have loose pieces or rugs, and clean them frequently outdoors. Use a hair broom for your floors and keep lower sashes closed while sweeping or dusting. Open upper sashes if possible. Never sweep rooms with a broom that raises dust.

III.
PURE WATER

Drink pure water. Avoid water from shallow and unprotected wells, and from ponds and streams. If in doubt, boil the water. Washington water is safe to drink. Avoid public drinking cups.

IV.
SAFE MILK AND CREAM

Tuberculosis, typhoid fever, and other diseases are often caused by drinking raw milk and raw cream. Get milk properly pasteurized, or home-pasteurize it or simply scald it. All cream, including that used for ice cream and butter, should be properly pasteurized to be safe.

V.
SLEEP

Get enough sleep. Sleep with windows open or, better still, outdoors.

VI.
KEEP CLEAN

Take a bath or sponge daily, and a warm bath, followed by a cold splash, plunge, or shower, once or twice a week

or oftener. Use soap freely. Wash your hands before handling food. Don't put fingers, money, paper, or pencils in your mouth. Don't bite your fingernails..

VII.
FOOD

Don't eat food that has been exposed to flies or dust, or touched by unclean hands. Raw fruit or vegetables so exposed should first be rinsed or washed thoroughly. Chew your food well.

VIII.
BREATHING AND EXERCISE

Breathe through your nose. Practice deep breathing. Sit and stand erect. Take plenty of outdoor exercise, but avoid excess in athletics; it may cause heart trouble. Don't eat or drink when overheated by exercise.

IX.
CARE OF THE TEETH

Clean your teeth in the morning and at bedtime; use a brush and prepared chalk. Teeth decay principally during the night. A quarter teaspoonful of Milk of Magnesia taken without water and kept in the mouth, just before retiring, will help to preserve the teeth. This applies even to young children. Teeth should be frequently inspected by a dentist.

X.
LIQUOR AND TOBACCO

Avoid tobacco and liquors. They are especially injurious to the young.

XI.
DON'T NEGLECT COLDS

Do not neglect coughs or colds. If you do not get well soon, go to a doctor or dispensary for treatment. Never cough, sneeze or breathe into another person's face. Don't spit on floors and sidewalks.

XII.
SUNSHINE

Admit plenty of sunshine into your houses and into your lives. Cultivate cheerfulness and kindliness; it will help you to resist disease. Your mind acts on your body.

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